determine rigorously the amplitude and duration of the cycle of inequalities.

Meantime the curve given in Plate 17, and the elements set forth in Equation II., may be taken as generally descriptive of these inequalities, and any further and more refined consideration of fuller material will not materially alter the conclusions come to.

Put generally the conclusions are as follows :—

(1) The mean period of *R Carinæ* is 309·3 days, but this value varies from 305·8 days as one limit, to 312·8 days as the maximum limit.

(2) The lower limit was passed in 1896, and the maximum limit in 1877.

(3) At present (1901) the duration of the period is 307·4 days and is increasing.

(4) A full cycle of periodic inequalities is completed in 37 or 38 years.

One is tempted to wander into speculation as to the cause, or causes, of this anomaly; but until we know more about the conditions of motion, or about the chemical changes, or about both combined, that produce the type of long period variation that we find in stars of the same class as *R Carinæ*, such excursions are unprofitable.

I think, however, the solution of the problem would be advanced materially if at each recurring maximum careful measures were made of the motion in the line of sight of the brighter variables. It could then be determined if this long period inequality is in any way connected with orbital movement.

Lovedale, South Africa:
1901 *May* 9.

Measures of Double Stars made at Mr. Edward Crossley's Observatory, Bermerside, Halifax. By Joseph Gledhill.

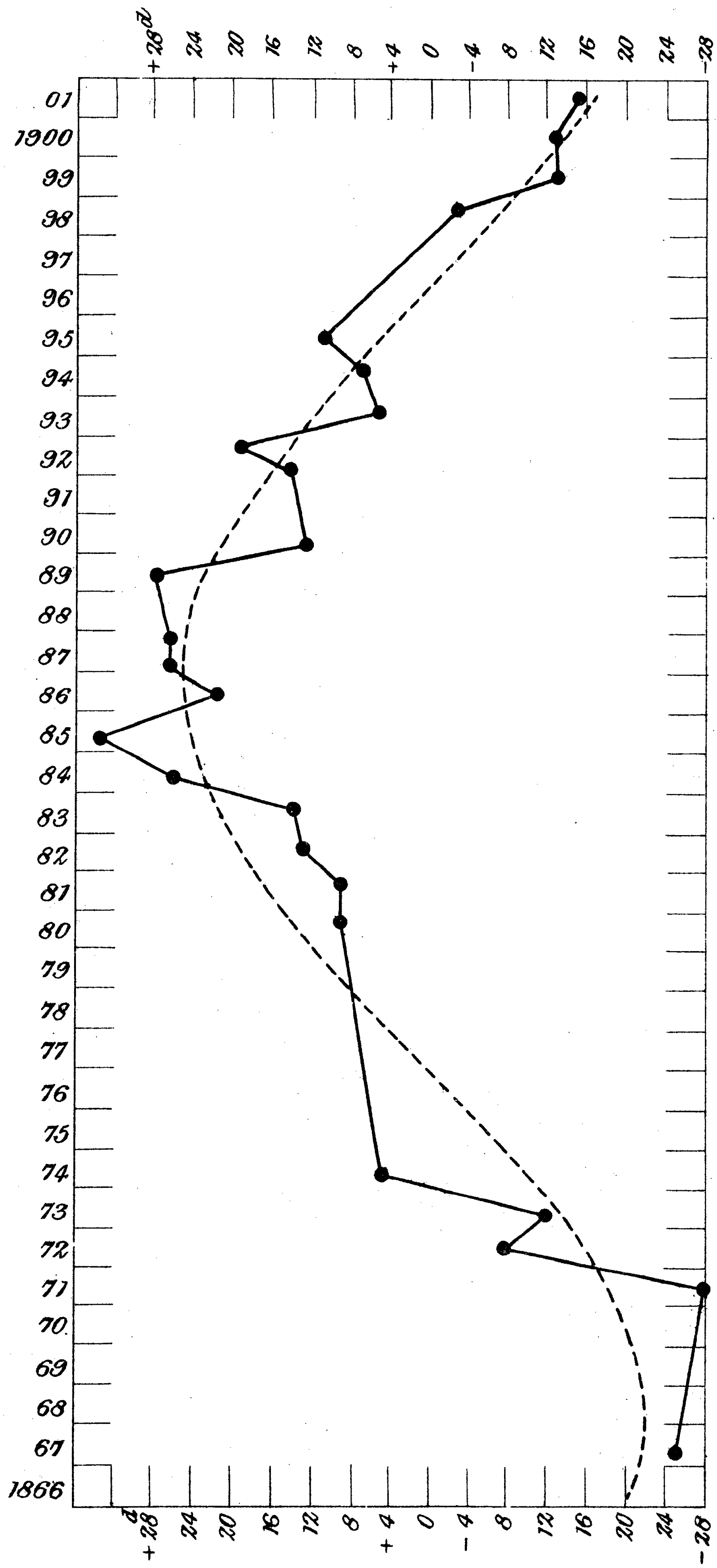
The following measures of a selected list of important binary stars have been made with the Cooke Equatorial and Simms' Micrometer. Up to 1896 the object-glass was the $9\frac{1}{3}$-inch Cooke; since that year a 9-inch photo-visual object-glass by the same makers has been used. The power most used was 290; occasionally 480 was used with advantage.

The usual method of measurement with a parallel-wire micrometer was followed.

Distances are almost always difficult to measure here owing to the unsteady air; hence it is that most of the distances under $1''$ recorded below are rather careful estimations than measures. Very few years afford half a dozen nights good enough for measures of distances under $1''$.

The R.A. and dec. are for 1900. When two or more sets of measures have been made in one year the mean value is given.

Secular inequality in the period of R Carinae.



Name.	R.A.	Dec.	Date.	Position Angle.	Distance.	Nights.
	h m	° ′		°	″	
Σ 3062 ...	0 1	+57 53	1895·282	330·6	1·3	1
			8·695	339·6	1·4	4
η Cass. Σ 60	0 43	+57 18	1891·059	190·8	4·7	4
			2·245	194·6	4·8	4
			3·218	198·8	4·7	4
			4·084	202·3	4·9	5
			6·545	209·9	4·8	5
			8·795	214·6	4·5	5
			1900·787	222·7	5·0	10
36 Androm. Σ 73	0 49	+23 4	1894·037	12·4	1·0	3
			6·896	15·6	1·3	3
			1900·786	17·0	1·0	8
γ^2 Androm. OΣ 38	1 58	+41 51	1896·833	117·6	0·5	5
			8·742	115·4	0·5	13
			9·561	115·4	0·5	4
14 *i* Orionis OΣ 98	5 2	+ 8 22	1891·079	189·9	1·1	2
			4·136	186·5	0·9	7
			6·108	183·7	1·0	4
			8·885	182·1	0·9	3
			9·033	180·7	...	1
η Orionis ...	5 19	− 2 29	1891·082	84·2	1·2	2
			2·451	84·1	1·1	8
			4·128	84·4	1·0	8
			6·154	86·5	...	5
			8·953	86·2	...	1
			9·024	81·1	1·0	6
12 Lyncis, A.B. Σ 948	6 37	+59 34	1891·075	122·3	1·8	2
			2·745	123·3	1·6	3
			1900·199	120·3	2·0	3
Castor Σ 1110	7 28	+32 7	1890·358	229·8	5·5	6
			1·107	230·0	5·6	10
			2·209	229·7	6·0	11
			3·272	228·1	5·7	10
			4·082	233·1	5·8	3
			5·281	227·7	5·6	5
			8·944	226·0	5·5	5
			9·177	225·1	5·8	19
			1900·492	225·7	5·6	16

Name.	R.A. h m	Dec. ° ′	Date.	Position Angle. °	Distance. ″	Nights.
ζ Cancri, A.B. Σ 1196	8 6	+17 58	1891·131	33·0	1·1	5
			2·419	27·2	1·0	6
			3·220	28·2	1·0	6
			4·060	23·3	1·0	4
			5·287	21·5	1·0	4
			6·265	18·2	1·1	6
			9·086	11·1	1·0	5
			1900·295	5·8	1·0	4
ω Leonis Σ 1356	9 23	+9 30	1890·252	102·1	0·7	5
			1·239	103·6	0·6	14
			2·244	103·5	0·7	9
			3·283	104·3	0·7	15
			4·093	104·4	0·8	7
			6·143	109·5	0·8	9
			7·360	107·0	0·8	6
			9·178	111·1	0·9	14
			1900·268	111·2	0·9	12
γ Leonis Σ 1424	10 14	+20 21	1890·251	114·1	3·7	5
			1·174	113·6	3·8	5
			2·255	112·9	4·1	10
			3·220	114·7	3·5	6
			4·131	116·3	3·7	5
			6·213	116·8	3·6	13
			7·360	114·7	3·7	6
			8·945	117·0	...	1
			9·194	116·4	3·9	16
			1900·266	116·3	3·6	11
ξ Ursæ Majoris Σ 1523	11 13	+32 6	1890·249	211·8	1·7	4
			1·273	201·0	1·3	18
			2·296	192·7	1·8	15
			3·301	184·7	1·7	17
			4·205	180·9	1·8	14
			6·272	173·9	2·0	7
			9·234	152·9	2·1	9
			1900·300	151·0	2·1	15
ι Leonis Σ 1536 ...	11 19	+11 5	1897·257	55·9	2·4	1
			1900·317	57·0	2·2	3

Name.	R.A.	Dec.	Date.	Position Angle.	Distance.	Nights.
	h m	° ′		°	″	
γ Virginis ... Σ 1670	12 37	− 0 54	1890·246	153·4	5·5	3
			1·304	153·1	5·6	11
			2·336	151·8	5·8	11
			3·291	151·6	5·7	16
			4·247	151·3	5·5	9
			5·261	331·8	5·6	3
			6·266	332·3	5·7	6
			7·363	331·4	5·7	8
			1900·271	331·1	5·6	10
35 Comæ Ber. Σ 1687	12 48	+21 48	1895·501	75·6	1·0	4
			1900·313	77·0	1·1	2
25 Canum V. ... Σ 1768	13 33	+36 48	1895·501	137·2	1·0	4
			8·517	132·2	1·0	1
			1900·313	129·9	1·2	2
ξ Boötis ... Σ 1888	14 47	+19 37	1893·381	236·9	3·1	5
			4·346	232·7	3·1	4
			5·500	227·0	3·2	4
			7·531	216·7	2·5	1
			8·657	210·5	2·4	9
η Cor. Bor. ... Σ 1937	15 19	+30 39	1891·312	216·8	...	10
			2·489	234·?	...	12
			3·499	240·1	0·5	11
			4·295	261·7	0·4	3
			5·589	285·1	0·4	4
			1897·520	328·3	0·5	14
			8·517	343·4	0·5	1
			1900·382	5·5	0·7	6
μ^2 Boötis ... Σ 1938	15 21	+37 43	1892·392	94·1	0·8	4
			3·674	85·4	0·6	1
			4·297	85·9	0·9	2
			7·535	79·3	0·9	4
			8·657	77·3	0·9	10
γ Cor. Bor. ... Σ 1967	15 39	+26 37	1891·313	120·2	0·5	11
			2·567	120·0	...	4
			3·630	119·5	0·6	9
			4·321	118·6	0·7	3
			5·419	117·4	0·5	1
			7·513	116·7	0·7	12
			8·517	115·2	0·7	1
			1900·415	116·1	...	3

Name.		R.A.	Dec.	Date.	Position Angle.	Distance.	Nights.
		h m	° ′		°	″	
σ Cor. Bor. Σ 2032	...	16 11	+34 7	1892·560	206·7	4·0	2
				3·455	209·6	4·2	1
				4·328	210·3	4·0	3
				5·500	211·9	4·4	4
				7·509	208·8	4·3	14
				8·517	209·6	4·1	1
				1900·350	212·7	4·4	7
λ Ophiuchi Σ 2055	...	16 26	+ 2 12	1891·359	47·3	1·4	1
				2·693	47·5	1·5	2
				3·463	48·8	1·4	10
				7·545	49·3	1·3	4
ζ Herculis Σ 2084	...	16 38	+31 47	1893·449	54·4	1·4	4
				5·631	29·8	0·9	2
				7·543	16·1	0·7	4
				8·625	352·4	0·5	6
				1900·420	263	...	2
70 Ophiuchi Σ 2272	...	18 0	+ 2 33	1892·686	317·8	2·3	2
				3·449	311·8	2·4	8
				5·597	296·6	2·2	1
				6·887	289·7	2·0	3
				7·550	283·4	2·0	6
ε Lyræ Σ 2382	...	18 41	+39 32	1900·522	12·5	3·4	9
5 Lyræ Σ 2383	...	18 41	+39 31	1900·522	130·5	2·5	9
δ Cygni Σ 2579	...	19 42	+44 53	1890·715	310·7	1·4	4
				2·705	308·3	1·5	8
				3·613	305·6	1·6	20
				5·714	307·2	1·6	3
				6·871	304·5	1·7	5
				7·622	303·7	1·7	9
				8·676	302·5	1·7	11
				1900·621	127·2	1·5	17
β Delphini β 151	...	20 33	+14 15	1892·758	330·4	0·4	3
				3·702	341·5	0·5	15
				6·857	355·3	0·7	7
				7·648	359·6	0·7	5
				8·711	2·4	0·8	20
				1900·655	8·0	0·7	23

Name.		R.A.	Dec.	Date.	Position Angle.	Distance.	Nights.
		h m	° ′		°	″	
λ Cygni	...	20 43	+36 8	1890·734	77·5	...	2
OΣ 413				2·706	73·4	...	2
				3·588	71·8	0·7	30
				5·714	73·8	0·6	3
				6·871	70·5	0·6	5
				7·564	69·1	0·6	5
				8·754	68·9	0·6	11
				1900·648	64·8	0·6	18
ε Equulei	...	20 54	+ 3 55	1896·842	284·6	0·7	3
Σ 2737				8·746	282·2	0·8	11
				1900·652	289·8	0·6	10
61 Cygni	...	21 2	+38 16	1895·597	124·0	20·3	1
Σ 2758				1900·857	124·9	22·0	7
δ Equulei	...	21 10	+ 9 37	1896·842	201·3?	...	3
OΣ 535				8·775	201·8	...	7
52 Pegasi	...	22 54	+11 12	1896·875	218·6	1·0	5
OΣ 483				7·663	219·2	1·0	3
				8·870	218·5	1·0	7
				1900·637	220·4	1·0	4
85 Pegasi	...	23 57	+26 34	1896·875	208·0	0·8	5
β 85				7·638	223·3	0·7	4
				8·816	234·4	0·7	8

Observations of Mars made at Mr. Edward Crossley's Observatory, Bermerside, Halifax, during the Opposition of 1900–1901. By Joseph Gledhill.

The following observations were made with the 9-inch photo-visual object-glass of the Cooke Equatorial. The powers used were 240 and 330. The observing conditions were almost invariably poor, and never really good.

1901 February 11, 9^h. The Kaiser Sea was about central, and formed a very striking feature; its extreme northern portion, where it is joined to the western end of Nasmyth Inlet, was not seen. Nasmyth Inlet and Lassell Sea were often but not steadily seen. The dark Knobel Sea lay near the eastern limb. The N. polar cap was of course a very prominent feature;